



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,069	07/23/2001	Charles H. Perry	FIS920000062US2	6945

7590 10/10/2003
Cantor Colburn LLP
55 Griffin Road South
Bloomfield, CT 06002

EXAMINER

GOFF II, JOHN L

ART UNIT PAPER NUMBER

1733

DATE MAILED: 10/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/911,069

Applicant(s)

PERRY ET AL.

Examiner

John L. Goff

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. This action is in response to Amendment B received on 7/22/03. The previous rejections under 35 U.S.C. 112 have been overcome.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 11 requires applying a conductive polymer composition on a first contact pad, disposing a first solderable cap in contact with the composition, and curing the composition. Claim 11 depends from claim 1. Claim 1 has been amended to require a completed interconnection. A completed interconnection according to the specification requires a self-supporting assembly comprising a cured conductive polymer composition in contact with at least a first solderable cap. The completed interconnection is applied to the first contact pad after its fabrication (See the specification page 9, lines 11-25). Thus, it appears claim 11 is directed to an interconnection that is not a completed interconnection prior to its application. It is suggested to delete claim 11.

Claim Rejections - 35 USC § 103

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 5-12, and 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Higashiguchi (U.S. Patent 5,883,432) in view of IBM (IBM Technical Disclosure Bulletin – “Solder Plated Resin Ball”).

Higashiguchi is directed to forming an electrical interconnection between two devices, a semiconductor device and a printed circuit board. Higashiguchi teaches bonding (soldering) metal bumps (solderable caps) onto a printed circuit pattern (contact pad) on the printed circuit board and onto an electrode pad on the semiconductor device using a bump bonder, applying an electrically conductive adhesive comprising a polymer component and conductive particles onto the metal bumps, and thermocompressing the metal bumps of the printed circuit board to the corresponding metal bumps of the semiconductor device to form an electrical interconnection (Figures 1A and 2 and Column 3, lines 1-3 and 5-9 and Column 4, lines 5-12). Higashiguchi teaches the conductive particles comprise gold, silver, etc. (Column 3, lines 62-67 and Column 4, lines 1-2). Higashiguchi teaches the metal bumps comprise gold, solder, etc. (Column 3, lines 29-30). Higashiguchi is silent as to applying the electrical interconnection, i.e. pair of solderable

Art Unit: 1733

metal bumps and conductive adhesive, as a preform (completed interconnection). It would have been well within the purview of one of ordinary skill in the art at the time the invention was made to apply the electrical interconnection taught by Higashiguchi as a preform as it was well known in the art to apply electrical interconnections, e.g. resin surrounded by solder, in this convenient, precise, less time-consuming manner as shown for example by IBM. It is noted that while IBM shows the solder as a coating surrounding the adhesive and it is unclear whether or not this is analogous to a solderable "cap", it would have been obvious to one of ordinary skill in the art to apply the preformed electrical interconnection taught by Higashiguchi as modified by IBM in an experimentally determined shape, e.g. first and second solderable caps with adhesive therebetween, as a function of the interconnection strength and product made as doing so would require nothing more than ordinary skill and routine experimentation.

Regarding claims 6, 7, 17, and 18, Higashiguchi is silent as to a specific teaching on the size of the interconnection. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the optimal size of the interconnection as a function of the interconnection strength or type of product produced as doing so would require nothing more than ordinary skill and routine experimentation.

Regarding claims 8 and 19, Higashiguchi is silent as to the specific resistivity of the polymer component of the electrically conductive adhesive. However, absent any unexpected results it would have been obvious to one of ordinary skill in the art to use a conductive polymer composition having a low resistivity to improve the electrical contact between the two devices.

Art Unit: 1733

IBM discloses a preformed electrical interconnection for joining two electrical devices, e.g. between the pad of a semiconductor chip and a pad of a substrate. IBM teaches the interconnection comprises an adhesive coated with solder (See the technical bulletin).

7. Claims 2-4 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashiguchi and IBM in view of Kang et al. (U.S. Patent 6,337,522).

Regarding claims 2, 3, 13, and 14, Higashiguchi and IBM as shown above teach all of the limitations in claims 2, 3, 13, and 14 except for a specific recitation on the different types of polymer components that can be used in the electrically conductive adhesive. Absent any unexpected results, one of ordinary skill in the art at the time the invention was made would have readily appreciated using as the polymer component of the electrically conductive adhesive taught by Higashiguchi as modified by IBM components such as polyimides, siloxanes, etc. as it was well known in the art to form electrically conductive adhesives from these polymer components as shown for example by Kang et al.

Kang et al. are directed to forming an electrical interconnection between two devices. Kang et al. teach applying a solder ball to the contact pad of a first device, applying an electrically conductive adhesive to the contact pad of a second device, and thermocompressing the two devices together by joining the solder ball and the electrically conductive adhesive (Figure 4 and Column 6, lines 15-19 and 25-42). Kang et al. teach the electrically conductive adhesive comprises a polymer component and a conductive component. Kang et al. teach the polymer component comprises polyimides, siloxanes, etc. (Column 5, lines 37-42). Kang et al. teach the conductive component comprises conducting particles such as gold, silver, etc. (Column 5, lines 43-44).

Art Unit: 1733

Regarding claims 4 and 15, Higashiguchi teaches the conductive particles comprise gold, silver, etc. (Column 3, lines 62-67 and Column 4, lines 1-2).

Response to Arguments

8. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John L. Goff whose telephone number is 703-305-7481. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

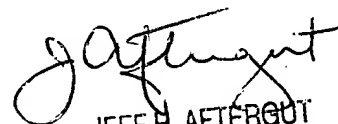
Art Unit: 1733

The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



John L. Goff
October 2, 2003



JEFF H. AFTERGUT
PRIMARY EXAMINER
GROUP 1300